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Publication Title:

CHAIR BACKREST

Abstract:

Abstract of WO0232263

Backrest for chair comprising a supporting structure (24), a lumbar support element (34), which moves in relation to the supporting structure (24), and an adjustment mechanism (40) used to control movement of the said lumbar support element (34). The aforesaid adjustment mechanism (40) comprises a first pair of levers (42a, 42b) connected to the supporting structure of the backrest (24), means (46) for synchronizing the oscillating movements of the said levers (42a, 42b) around the respective connecting axes (44), and a second pair of levers (48a, 48b), each of which is connected to a respective lever (42a, 42b) of the first pair and to the lumbar support element.

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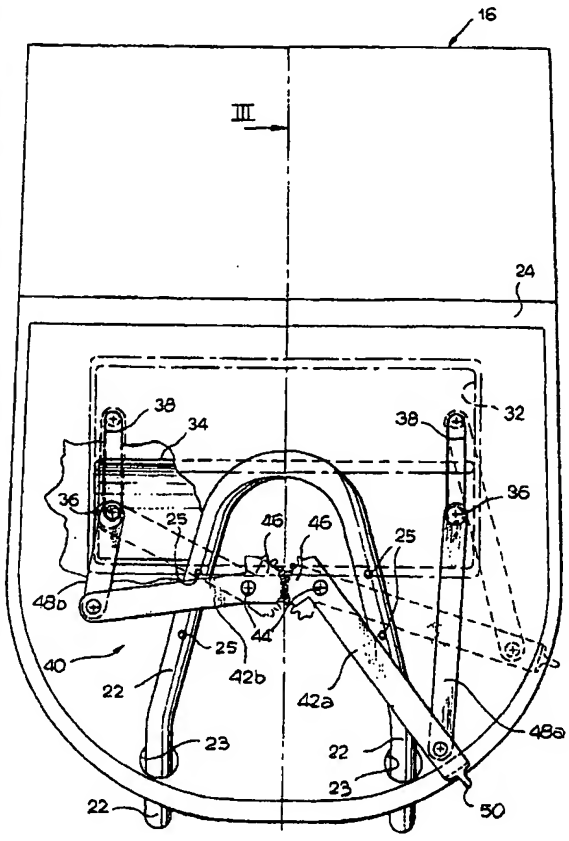
(54) Title: CHAIR BACKREST



(57) Abstract: Backrest for chair comprising a supporting structure (24), a lumbar support element (34), which moves in relation to the supporting structure (24), and an adjustment mechanism (40) used to control movement of the said lumbar support element (34). The aforesaid adjustment mechanism (40) comprises a first pair of levers (42a, 42b) connected to the supporting structure of the backrest (24), means (46) for synchronizing the oscillating movements of the said levers (42a, 42b) around the respective connecting axes (44), and a second pair of levers (48a, 48b), each of which is connected to a respective lever (42a, 42b) of the first pair and to the lumbar support element.

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"Chair backrest"

* * *

The present invention relates to a backrest for a chair provided with an adjustment device for the lumbar support of the user.

Chair backrests are known which are equipped with lumbar support elements that move vertically in relation to the supporting structure of the backrest and associated to adjustment mechanisms operated manually by the user to vary the vertical position of the lumbar support element.

The aim of the present invention is to provide a backrest equipped with a lumbar support element associated to a simple adjustment mechanism, which permits relatively ample adjustment travel of the lumbar support element and which has reduced overall dimensions in the direction of the depth of the backrest.

According to the present invention, this aim is achieved by a backrest with the characteristics as claimed in claim 1.

The present invention shall now be described in detail with reference to the annexed drawings, provided merely as a non-limiting example, in which:

- figure 1 is a schematic side view of a chair equipped with a backrest according to the present invention,
- figure 2 is a rear view of the backrest according to the invention in relation to arrow II in figure 1,
- figure 3 is a cross-section according to the line III-III in figure 2, and
- figure 4 is an analogous cross-section to the one in figure 3 illustrating the lumbar adjustment device in a different position.

With reference to figure 1, 10 indicates a chair comprising a base 12, a seat 14 and a backrest 16. Preferably, the chair 10 is provided with a mechanism that permits synchronized oscillating movement of the seat 12 and backrest 16 to be obtained, for example of the type described in the Italian patent application no. TO99A000476. In the form of implementation illustrated as an example in figure 1, the chair 10 comprises a central column 18 preferably adjustable in height, at the top of which is a casing 20 containing a mechanism that bears the seat 14 and backrest 16 in an oscillating manner. This mechanism comprises a pair of tubular components 22 that protrude from the rear part of the casing 20 and onto which the backrest 16 is fitted.

With reference to figures 2, 3 and 4, the backrest 16 has a supporting structure 24, for example made of plastic. The tubular supporting components 22 extend through respective holes 23 made in the supporting structure 24 and form, on the rear part of the supporting structure 24, a fastening portion with the general shape of an upside-down U to which the supporting structure of the backrest 24 is fastened using screws 25. As can be seen in figures 3 and 4, a padding 26 in soft flexible material is fitted to at least one part of the front side of the supporting structure 24. Preferably, the supporting structure of the chair 24 has an arched portion 28 with its convexity facing forwards, positioned in relation to a lumbar support area of the user. Preferably, the soft padding 26 is borne by a frame 30 fastened to the supporting structure of the seat 24. The frame 30 has a rectangular shaped opening 32 (figure 2) positioned in relation to the aforesaid lumbar support area of the backrest 16. A lumbar support element 34 is housed

inside the said opening 32 and is positioned between the padding 26 and the front side of the supporting structure 28. The lumbar support element 34 is preferably shaped like a half-shell with its convexity facing forwards. The lumbar support element 34 extends in a crosswise direction for essentially the same width as the width of the backrest area that comes into contact with the lumbar area of the user. This supporting element 34 bears a pair of pins 36 which protrude towards the rear part of the backrest and which extend through respective vertical slots 38 provided in the supporting structure 24.

A control mechanism 40 which permits adjustment of the vertical position of the lumbar support element 34 is positioned on the rear side of the supporting structure of the backrest 24. The control mechanism 40 comprises a first pair of levers 42a and 42b connected to the supporting structure of the backrest 24 around respective pins 44. The levers 42a and 42b have respective toothed sectors 46 which engage with one another. In the form of implementation illustrated in figure 2, the toothed sectors are identical to one another, so that the levers 42a and 42b always rotate at equal and opposite angles to one another around their respective pins 44. The control mechanism 40 comprises a second pair of levers 48a and 48b, each of which has a lower edge connected to the respective lever 42a and 42b and an upper edge connected to a respective pin 36 of the lumbar support element 34. The length of the levers 48a and 48b and the distance of the connecting points between the levers 42-48 and the pins 44 is defined so that the pins 36, following rotation of the levers 42, move along their respective slots 38 at the same speed, so that the lumbar support element 34 moves in a vertical direction parallel with

itself.

With reference to figure 2, the lever 42a has a operating portion 50 that protrudes from an edge of the backrest 16. The user sitting on the chair can move the operating portion 50 up or down, to vary the vertical position of the lumbar support element. Figure 2 illustrates with continual line and a dashed line the farthest positions of the levers 42 and 48 corresponding to the totally lowered and totally raised positions of the lumbar support element 34. Naturally, the user may select any intermediate position between these positions. Figures 3 and 4 illustrate the lumbar support element in the totally lowered position and totally raised position respectively. It can be seen that the lumbar support element 34 has a relatively wide range of regulation, in order to meet the requirements of users with noteworthy differences in height. The light pressure exerted by the padding 26 against the lumbar support element 34 holds the latter in the position set by the user. To permit the lumbar support element 34 to move along the convex surface of the supporting structure 24 of the seat, the use of a ball or deformable joint is envisaged for at least one of the connecting points of the levers 48a and 48b.

With reference to figures 3 and 4, the backrest 16 is provided with a rear closing shell 52 which is fitted and fastened to the rear part of the supporting structure of the backrest 24. The rear shell 52 defines an area inside which the control mechanism 40 is housed. It can be seen that the overall dimensions of the control mechanism 40 in the direction of the depth of the backrest is relatively limited and does not cause any noteworthy increase in the depth of the backrest compared to a version of chair without the adjustment mechanism for the lumbar support.

CLAIMS

1. Backrest for chair comprising:

- a supporting structure (24),

- a lumbar support element (34), movable in relation to the supporting structure (24), and

- an adjustment mechanism (40) used to control movement of the said lumbar support element (34),

characterized in that the aforesaid adjustment mechanism (40) comprises a first pair of levers (42a, 42b) connected to the supporting structure of the backrest (24), means (46) for synchronizing the oscillating movements of the said levers (42a, 42b) around the respective connecting axes (44), and a second pair of levers (48a, 48b), each of which is connected to a respective lever (42a, 42b) of the first pair and to the lumbar support element (34).

2. Backrest as claimed in claim 1, characterized in that the aforesaid lumbar support element (34) can move vertically in the space formed between a front side of the supporting structure of the backrest (24) and a covering (26) in soft and flexible material.

3. Backrest as claimed in claim 2, characterized in that the lumbar support element (34) moves along an arched surface of the supporting structure (24) with its convexity facing forwards.

4. Backrest as claimed in claim 2, characterized in that the aforesaid lumbar support element (34) is shaped like a half-shell with its convexity facing forwards.

5. Backrest as claimed in claim 2, characterized in that the lumbar support element (34) is equipped with a pair of pins (36) which extend through respective slots (38) provided in the supporting structure of the backrest (24).

6. Backrest as claimed in claim 1, characterized

in that the aforesaid levers (42a, 42b) are equipped with respective toothed sectors (46) which engage with one another.

7. Backrest as claimed in claim 1, characterized in that each lever (48a, 48b) of the aforesaid second pair is connected to the lumbar support element (34) or to the respective lever of the first pair (42a, 42b) by means of a ball or deformable joint.

8. Backrest as claimed in claim 2, characterized in that the aforesaid adjustment mechanism (40) is positioned on a rear side of the supporting structure of the backrest (24).

Fig. 1

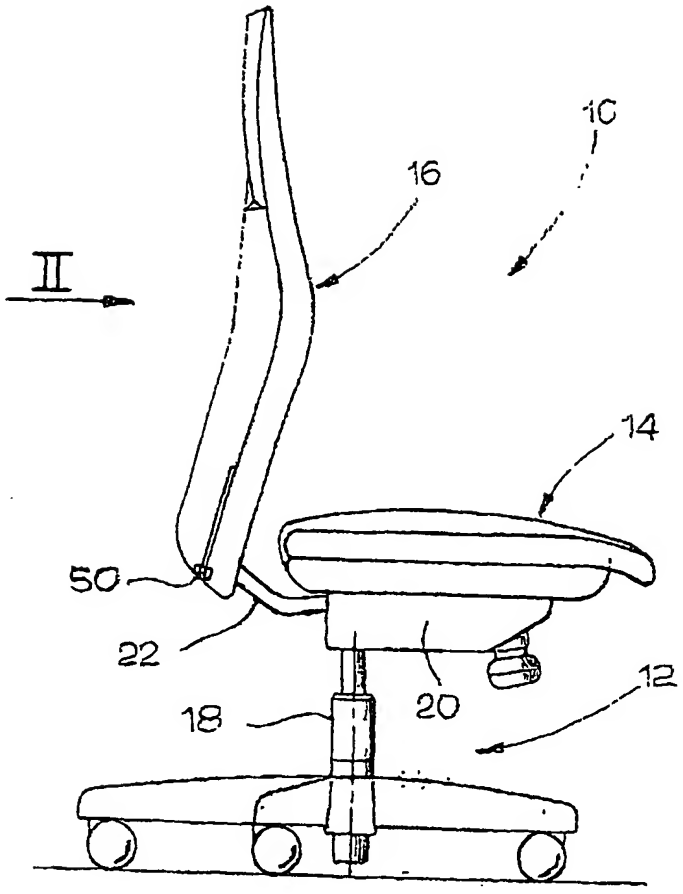


Fig. 2

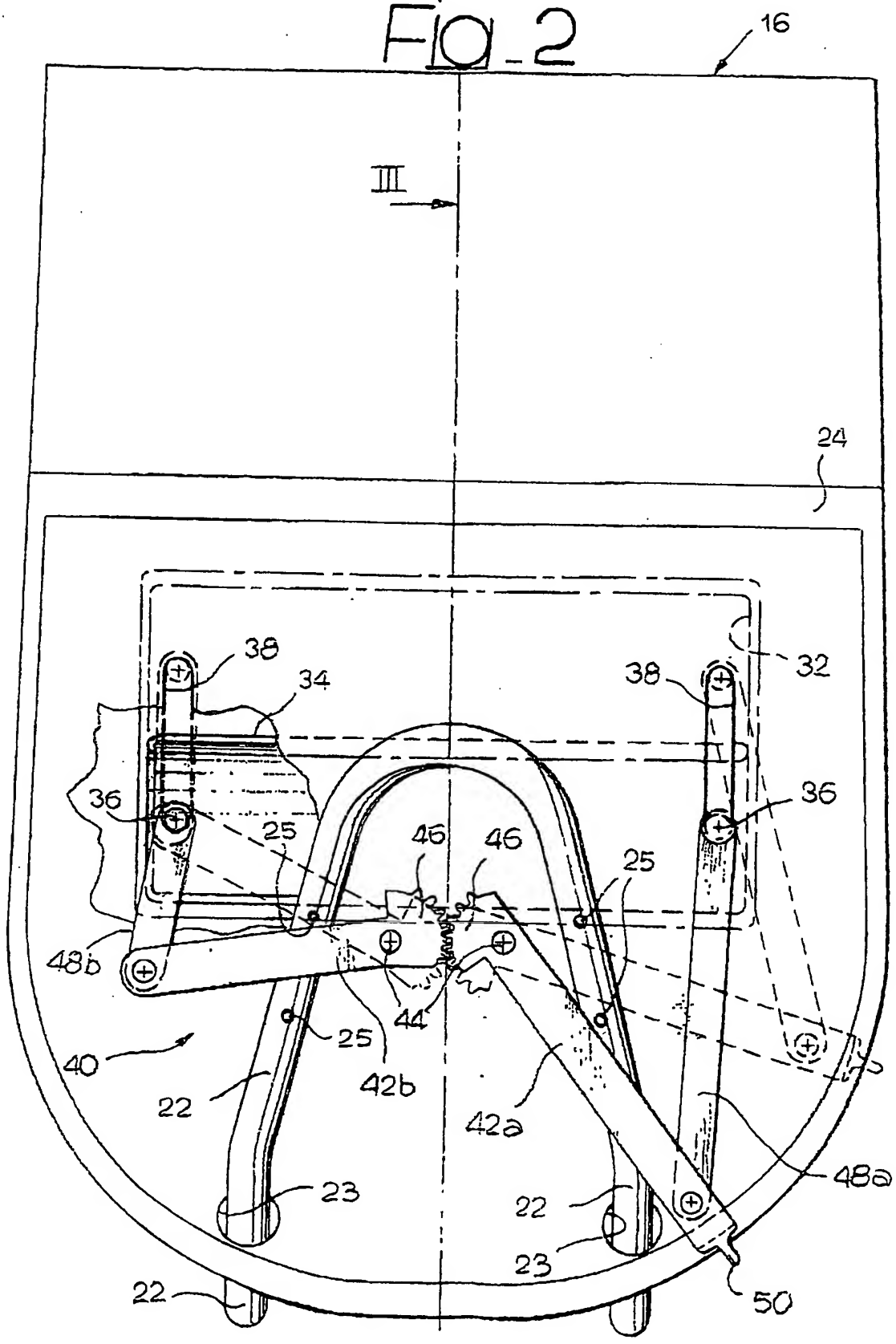


Fig_3

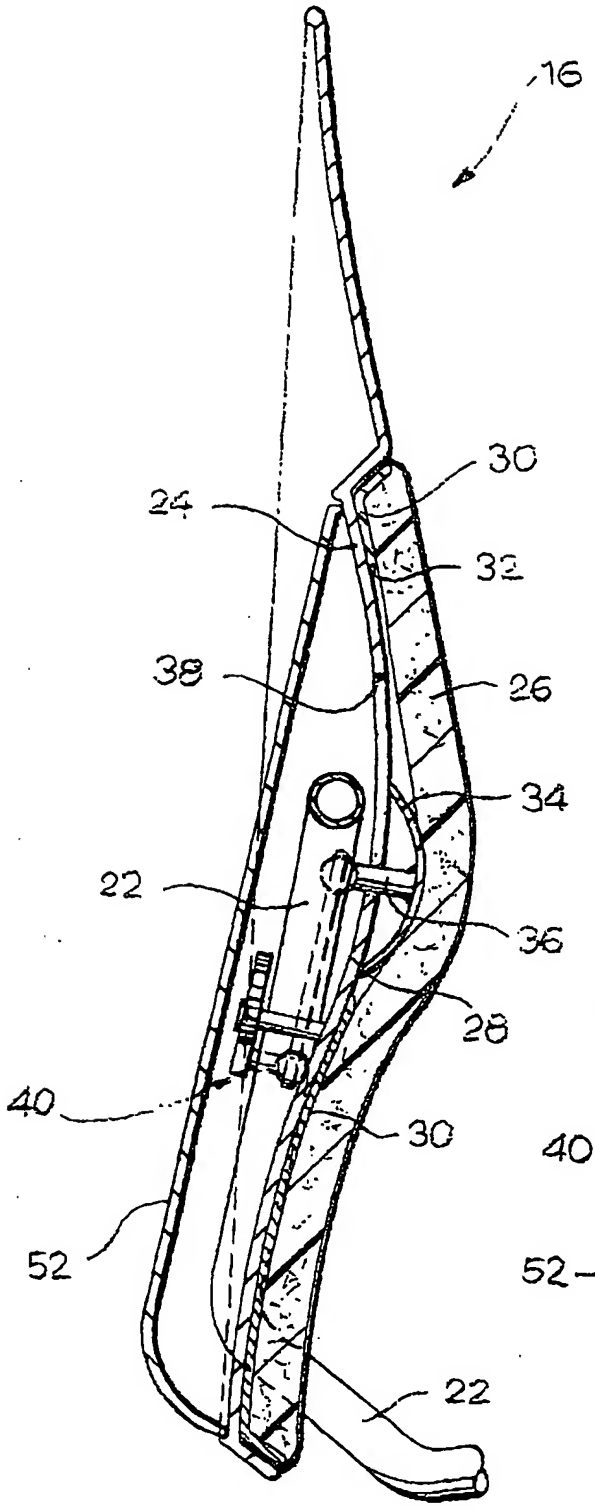
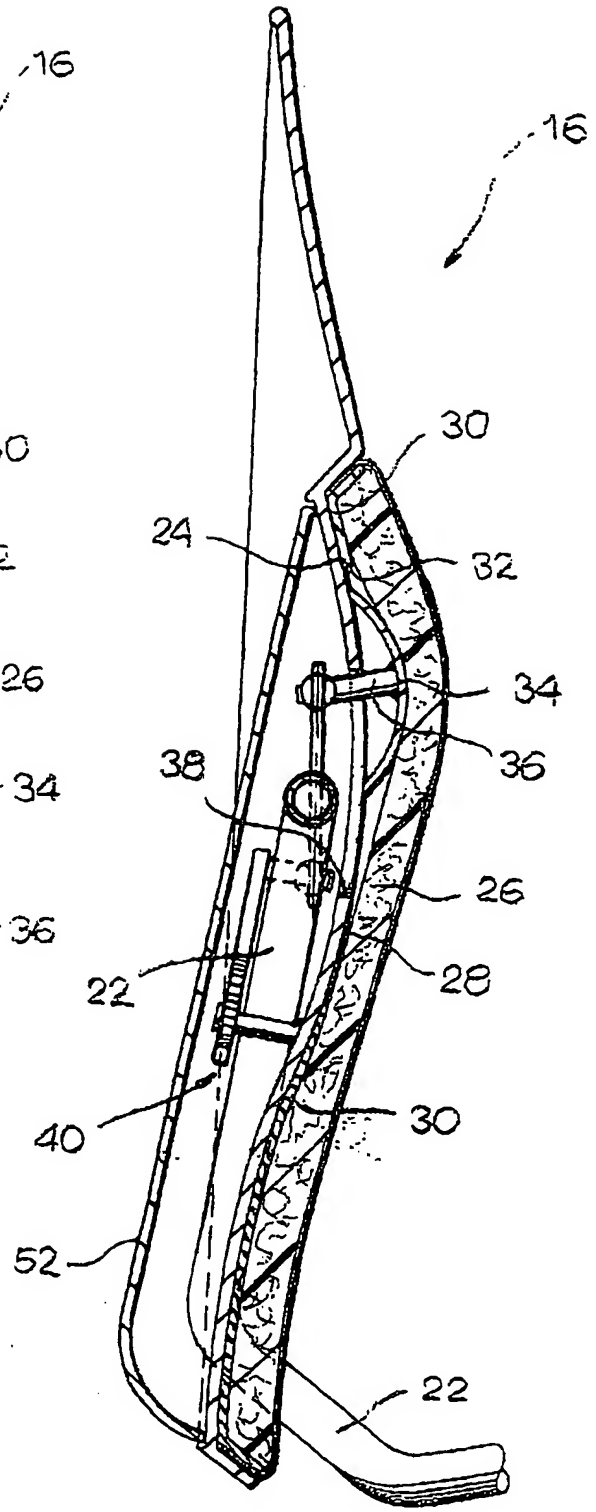


Fig_4



INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47C B60N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 39 42 486 A (KEIPER RECARO GMBH CO) 27 June 1991 (1991-06-27) column 2, line 44 -column 3, line 57 figures 5,6 pos. 11, 12, 14 ---	1-8
A	US 4 531 779 A (HASHIMOTO YUJI) 30 July 1985 (1985-07-30) figure 2, pos. 14a, 14b -----	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
12 January 2001	06 0[illegible] 2001

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nformation on patent family members

Int ational Application No
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3942486 A	27-06-1991	NONE	
US 4531779 A	30-07-1985	NONE	